

# SCIENTIFIC REVIEWS. OPINIONS

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## Trends of the Fourth Industrial Revolution

**A review of the monograph: Schwab K. The Fourth Industrial Revolution.**

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(Top Business Awards)



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The change of the global economic development paradigm, the transition to the next technological order, a radical change of industrial production organization – all these factors have lead to the formation of an economy that opens up new areas of economic

growth, enhances economic efficiency and expands the possibilities of consumption, creating new spheres of economic activity.

At present we are witnessing the penetration and development of technology in different spheres of life. Information and communication

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technology has become not only an integral part of everyday modern life, but also a necessary technological platform for modern business processes.

Information technologies and digital transformation are major drivers of technological change and prerequisites for ensuring competitiveness at the level of individual enterprises and at the level of countries and supranational unions; these drivers facilitate a restructuring of all economic and production processes, radical increase in productivity, improvement of the quality and reduction in the cost of goods and services.

Russia intends to transfer its industry to a digital technology platform with the help of the program “Digital economy of the Russian Federation” (Decree of the RF Government of July 28, 2017 No. 1632-r), whose aim is a system-wide development and implementation of digital technology in all spheres of life: economy, entrepreneurship, social activities and public administration. New technologies take the collection, aggregation and sharing of accumulated information to a fundamentally different level of quality with a minimal role and degree of human input. These technologies are becoming the drivers of the fourth industrial revolution.

Therefore, in our opinion, it is advisable to consider basic provisions and conclusions of the monograph by Klaus Schwab that reveals the features and major trends of the fourth industrial revolution.

The monograph is relevant from the point of view of an integrated notion of how

technologies change our lives and the lives of future generations, how they transform economic, social, cultural and humanitarian environment in which we live.

The book focuses on the way in which technology and society coexist. The author emphasizes that “the fundamental and global nature of this revolution means it will affect and be influenced by all countries, economies, sectors and people. It is, therefore, critical that we invest attention and energy in multistakeholder cooperation across academic, social, political, national and industry boundaries”. Such collaboration and cooperation is necessary in order to create a positive, unified and promising concept, which will help individuals and societies in all countries participate in current transformations and use their advantages.

The monograph consists of three parts. The first part provides an overview of the fourth industrial revolution. The second part describes major transformation technologies. The third part describes in detail the consequences of the revolution and some of the political challenges that it poses. In conclusion, the author offers some practical ideas and solutions for effective implementation, formation and use of the potential of this major transformation.

The main ideological premise of the monograph consists in its thesis that with each phase of technological development humankind has continuously moved from one economic practice to another that is newer and more efficient; from more expensive energy sources to more economical; from more heavy and

brittle materials to more lightweight, durable, flexible and resistant; besides, people have always complicated and increased the efficiency of the means of production, and expanded and developed their habitat. All this was accompanied by technological progress, which was a driver of these changes and a tool for development of an individual and the entire humankind.

The author emphasizes that at each stage of technological and social cycles there is a gap between the old generations and methods they used and the new generations and new tools and methods of their work.

The monograph focuses its attention on the premise that the world is on the threshold of a new industrial revolution – the fourth revolution, and its impact on the world and people exceeds the impact of all other revolutions taken together. The first revolution was marked by mechanization, the second – by electricity, the third – by the automation of production, and the fourth is characterized by the culmination of development of information technology, penetration of the Internet in all spheres of the economy, development of an ecosystem of the Internet of things and related technology of artificial intelligence and neural networks.

The fourth industrial revolution is unfolding before our eyes. Some believe it is a continuation of a digital revolution, its new stage where machines start to replace people. According to Klaus Schwab, a qualitative difference of the fourth revolution from the third lies in a synergistic effect which arises

from the merging of different technologies: computer, information, nanotechnology, biotechnology, etc. Another aspect of the fourth revolution, according to Schwab and other sociologists and futurologists, may be the blurring of boundaries between physical, digital (informational) and biological (including human) worlds.

Schwab proves the distinctness of the fourth industrial revolution with the help of three factors: velocity, breadth and depth, and systems impact.

He focuses on the fact that contrary to the previous industrial revolutions, this one is evolving at an exponential rather than linear pace. It builds on the digital revolution and combines multiple technologies that are leading to unprecedented paradigm shifts in the economy, business, society, and individually. It involves the external and internal transformation of entire systems, countries, companies, industries and society.

As the author notes, his book serves as a primer and guide to the fourth industrial revolution that determines the essence of this phenomenon, its consequences, the impact on humankind and the possibilities of its use for the common good. The book is intended for those interested in our common future and those determined to use the opportunity of the revolutionary changes to make the world better.

According to the text of the monograph, the author does not define the fourth industrial revolution, but points to the particular fields of its analysis – the coexistence of technology

and society. However, the emphasis is placed on technological innovation: “Take dramatic technological change as an invitation to reflect about who we are and how we see the world”.

We agree with Klaus Schwab as he points out that “the required levels of leadership and understanding of the changes underway, across all sectors, are low when contrasted with the need to rethink our economic, social and political systems”.

When analyzing the changes produced by the fourth industrial revolution, Schwab divides them into five critical points and subsequent states: tipping point; positive effect; negative effect; uncertain effect, and deep shift in action.

He notes that currently “the world lacks a consistent, positive and common narrative that outlines the opportunities and challenges of the fourth industrial revolution, a narrative that is essential if we are to empower a diverse set of individuals and communities and avoid a popular backlash against the fundamental changes underway”.

Considering the contemporary paradigm of scientific thought concerning the fourth industrial revolution and its attendant technologies, we note that it is based on the premise that modern organizations face the opportunities as well as threats, some of which are not yet very well understood by business and society on the whole.

Analysis of current research works and review of economic literature on these issues helps systematize the main aspects of the impact of the new technological revolution.

First, the fourth industrial revolution will not only upgrade individual tools and methods of management, but it will also contribute to a radical transformation of management functions and ways of organizing work in modern companies. Implementation of new technological solutions will require fundamental changes in the organization of interaction between man and machines, new skills of employees and new methods of production management.

Second, the transition to the fourth industrial revolution will lead to transformations in the labor market, since it is related to the need for workers of a new type who have other professional, procedural, organizational and even social skills. The introduction of new advanced technologies will be accompanied by dequalification of current employees and the need either for their retraining or for an increase in the costs of recruitment of new employees with relevant knowledge and skills. There is an ongoing hot debate on the impact of the fourth industrial revolution on employment between the supporters of technologies, who see in them the limitless possibilities for the formation of new occupational groups, growth of labor productivity of the current staff, reduction of the process of its routinization, and their opponents, who point to a massive substitution of labor, significant reduction and even disappearance of some professional groups and growth of social inequality.

Third, the new industrial revolution will help reduce organizations’ expenses on collecting and analyzing information.

Moreover, they can continuously receive various data at a lower cost than previously, analyze them and obtain ready-made solutions.

It will mostly affect the processes of interaction with target segments where technology will simplify the creation of new products and reduce the period of their market launch with the help of new tools of accounting, analyzing and forecasting consumer preferences; besides, technology will also create the basis for accounting and generating consumer experience, and analysis of their individual preferences.

Thus, as the author notes, the fourth industrial revolution “is not only changing what we do but also who we are”. “For all the reasons already mentioned, we are at the threshold of a radical systemic change that requires human beings to adapt continuously. As a result, we may witness an increasing degree of polarization in the world, marked by those who embrace change versus those who resist it.”

Klaus Schwab concludes his monograph with a brief but very informative description of 23 “deep shifts” triggered by the fourth industrial revolution. They include a variety of

aspects of digital technologies, like the devices implanted into the human body, “digital presence vision” as the new interface, the Internet of things, “smart cities”, “big data” for decisions, and various applications of 3D printing.

Thus, according to Klaus Schwab, the new industrial revolution has had and will have an impact on all spheres of society.

Currently, industrialized countries are already at the threshold of the fourth industrial revolution, which has not yet received a generally accepted name. For Russia, these issues are critical from the viewpoint of searching for a new model of economic growth. An economy that is based on knowledge and intellectual capabilities of humankind will be supported by new technologies that will shape global economic development in the next two to three decades.

The fourth industrial revolution will lead to a redistribution of positions of countries in global competition, and this will provide a chance for Russia’s economy to recover successfully from the crisis and ensure its economic and technological security.

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